

MEMORANDUM

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Re: **National Academies Release Dietary Reference Intakes for Sodium and Potassium**

The National Academies of Sciences, Engineering and Medicine (NASEM) recently released updated Dietary Reference Intakes (DRIs) for sodium and potassium. ^{1/} For the adequate intake of sodium, the report reaffirms the existing 1,500 mg level for individuals ages 14-50, establishes a lower level for children age 1-13, and sets a higher level for adults ages 51 and older. For the adequate intake of potassium, the report establishes a significantly lower level for all populations except infants. The report also assigned a Chronic Disease Risk Reduction (CDRR) level for sodium of 2,300 mg for most populations. This is the first time a CDRR has been assigned to a nutrient. In contrast to the CDRR, which represents the level above which intake reduction is expected to reduce chronic disease risk within an apparently healthy population, the report explains that the Tolerable Upper Intake Level (UL) now refers to toxicity. NASEM found insufficient evidence of risk of toxicity from excess sodium or potassium, so a UL was not set for either nutrient.

Background

The DRI reports reflect a joint effort between the United States and Canada to set quantitative reference values for the apparently healthy population. NASEM can assign a variety of scores to a nutrient: Estimated Average Requirement (EAR), Recommended Dietary Allowance (RDA), Adequate Intake (AI), and the UL. This year, for the first time, the DRI report established a new nutrient score, the Chronic Disease Risk Reduction level (CDRR). The CDRR is defined as the level above which intake reduction is expected to reduce chronic disease risk within an apparently healthy population. Nutrient-related chronic disease questions address risk within the range already determined to be safe and adequate and address probable, long-term effects on multifactorial pathways. The CDRR is different from the UL, which will now be used to refer only to toxicity – i.e., the rapid onset effects of excessive doses of specific nutrients, like liver damage from excessive copper intake – rather than chronic disease considerations.

Sodium and potassium are interrelated, physiologically essential nutrients that have been implicated in chronic disease risk, particularly cardiovascular disease as it manifests through blood pressure. NASEM reviewed the two nutrients concurrently because they are inextricably linked in both biology

^{1/} Dietary Reference Intakes for Sodium and Potassium, National Academies of Science and Medicine (March 2019), available at: <http://www.nationalacademies.org/hmd/Reports/2019/dietary-reference-intakes-sodium-potassium.aspx>.

and study designs. When the nutrients were last reviewed in 2005, the evidence supported an AI for both nutrients, and a UL only for sodium. The 2019 DRI report reconsidered the 2005 AI and UL levels and considered adding CDRR values for sodium and potassium.

Sodium

For sodium, the report assigned AI and CDRR values, withdrew the 2005 UL level for sodium, and found insufficient evidence to assign other values. The report reaffirms the sodium AI for individuals ages 14-50, decreases the sodium AIs for children age 1-13, and increases the sodium AIs for adults ages 51 and older (see Table 1).

Table 1. Sodium Adequate Intake (AI) Levels

Population Group	2005 AI (mg/d)	2019 AI (mg/d)
Infants, 0-6 mos.	120	110
Infants, 7-12 mos.	370	370
Children, 1-3 years	1,000	800
Children, 4-8 years	1,200	1,000
Children 9-13 years	1,500	1,200
Children 14-18 years	1,500	1,500
Adults 19 years – 50 years	1,500	1,500
Adults 51 – 70 years	1,300	1,500
Adults > 70 years	1,200	1,500

The report withdrew the 2005 UL for sodium, which reflects the recharacterization of the UL level as a toxicity level. In other words, the report found that toxicity is not a concern in the context of dietary intake of sodium. The DRI also establishes, for the first time, a CDRR level for sodium (see Table 2). As support for the CDRR for sodium, the report found:

- strong evidence that reducing sodium intake decreases systolic and diastolic blood pressure;
- moderate to high strength of evidence for both a causal relationship and an intake-response relationship between sodium and several interrelated chronic disease indicators: cardiovascular disease, hypertension, systolic blood pressure, and diastolic blood pressure;
- moderate evidence of a causal relationship between reductions in sodium intake and all-cause mortality, cardiovascular disease incidence, and hypertension incidence.

Table 2. Sodium Chronic Disease Risk Reduction (CDRR) Intakes

Population Group	2005 UL (mg/d)	2019 CDRR Recommendation
Children, 1-3 years	1,200	Reduce intakes if above 1,200 mg/d
Children, 4-8 years	1,900	Reduce intakes if above 1,500 mg/d
Children 9-13 years	2,200	Reduce intakes if above 1,800 mg/d
Children 14-18 years	2,300	Reduce intakes if above 2,300 mg/d
Adults > 19 years	2,300	Reduce intakes if above 2,300 mg/d

NASEM found that sodium intakes are very high, with almost universal intake exceeding the AI, and a vast majority of the population exceeding the CDRR (see Table 3). The report notes that “[m]ost of the salt in our modern diet pattern comes from commercially prepared food and beverage components and products, not from salt added by consumers cooking at home or from salt added by the consumer at the time of consumption.” For the population over 2 years of age, the top food

categories contributing to sodium intake are identified as breads, pizza, sandwiches (burgers, chicken/turkey sandwiches, egg/breakfast sandwiches, and others) and cured meats and poultry.

Table 3. Sodium Risk Characterization

Groups	Percent with Intakes > AI	Percent with Intakes > CDRR
Children	95-99%	62-99%
Adults	85-99%	34-98%
Pregnant	98-99%	70-94%
Lactating	98-99%	76-99%

Potassium

For potassium, consistent with the 2005 DRI, the 2019 DRI only assigned an AI value. There was insufficient evidence to assign any of the other values. The potassium AIs decreased significantly for all populations except infants, dropping from 4,700 mg/day to 2,300-3,500 mg/day, depending on age and gender. The report found moderate evidence that potassium supplementation may significantly reduce systolic and diastolic blood pressure; however, a CDRR could not be established.

The DRI risk characterization found about half of the population to have intakes of potassium exceeding the AI: 23-53% of children, 17-40% of adults, 32-48% of pregnant women, and 41-51% of lactating women. Across DRI groups, non-Hispanic African Americans had the lowest potassium intakes.

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The DRI will also be integrated into the Dietary Guidelines for Americans (DGAs) 2020-2025 and will set the stage for all nutrition policies put forth by the federal government. For example, now that the DRI has been updated, we expect FDA to revisit guidance on establishing voluntary sodium reduction targets. ^{2/} We will continue to monitor federal regulatory policies related to sodium and potassium intake.

^{2/} Draft Guidance for Industry: Voluntary Sodium Reduction Goals: Target Mean and Upper Bound Concentrations for Sodium in Commercially Processed, Packaged, and Prepared Foods (June 2016), available at: <https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/ucm494732.htm>